Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Remington Arms Company, Inc. Request for a Waiver of the Part 15 Regulations	)	ET Docket No. 05-183
	)	

ORDER

Adopted: November 16, 2005 **Released: November 18, 2005**

By the Commission:

I. INTRODUCTION

1. By this action, we are granting the Request for Waiver filed on April 27, 2005, by the Remington Arms Company, Inc., Law Enforcement Technologies Division ("Remington") to permit the certification and subsequent marketing and operation of its Remington Eyeball R1 transmitter. Specifically, Remington requests that we waive Section 15.247 of our regulations which requires the use of digital modulation techniques and limits the power spectral density for digital modulated systems operating in the 2400-2483.5 MHz band.[1] We find that a grant of this waiver would allow the operation of devices that would provide law enforcement agencies with new technology for investigating hostile situations without endangering police personnel. We are limiting the marketing of these devices to law enforcement agencies to reduce the potential for interference from Eyeball R1 transmitters to other unlicensed devices operating in the 2400-2483.5 MHz band.

II. BACKGROUND

2. The Remington Eyeball R1 ("Eyeball R1") imaging sensor operates in the 2400-2483.5 MHz band (the "2450 MHz band") using analog modulation. It provides live audio and color or black and white video of a 55 degree conical field of view, the direction of which is remotely controlled using a transmitter operating in the 902-928 MHz band (the "915 MHz band").[2] The Eyeball R1 imaging sensor is designed to be thrown like a baseball to a remote or confined and potentially hazardous location to obtain real time images of, and sound from, the surrounding area. It is intended for counter-terrorism and law enforcement operations in urban terrain applications as well as in police activities requiring observation and surveillance.

3. The unlicensed operation of a transmitter employing analog modulation in the 2450 MHz band normally is subject to the requirements of Section 15.249 of the Commission's regulations.[3] Operation under Section 15.249 is limited to a maximum average fundamental emission level of 50 mV/m and a peak level of 500 mV/m, both as measured at 3 meters. These emission levels are equivalent to equivalent isotropically radiated powers ("EIRP") of approximately 750 uW, average, and 75 mW, peak. Section 15.247 permits the operation of wideband systems employing digital modulation

[1] *See* 47 C.F.R. § 15.247.

[2] The control transmitter operates under the existing rule provisions, and no waiver is requested for this portion of the system.

[3] *See* 47 C.F.R. § 15.249. Operation on a licensed basis is permitted in the 2450-2483.5 MHz band. *See* 47 C.F.R. §§ 90.20, 90.35 and 90.103.

within the 2450 MHz band at a peak transmitter output power of 1 W and an EIRP of 4 W.[4] Remington requests a waiver of the digital modulation requirement of Section 15.247 to permit its wideband analog video and audio transmission to operate at the higher power level allowed for digitally modulated devices in the 2450 MHz band. Remington also requests a waiver of the power spectral density ("PSD") limit in Section 15.247 that is applicable to a digital modulated transmitter.[5]

4. In support of its petition, Remington notes that its Eyeball R1 transmitter will serve the public interest in saving lives and combating terrorism. Remington states that any possible interference would be limited to other unlicensed devices in the immediate area surrounding the Eyeball R1 and that this area, in many situations, would be evacuated or under police control. Remington adds that the potential for disruption will be of limited duration, is unlikely to recur in the same area or location, will rarely exceed the area of immediate concern to the law enforcement operation, and will be roughly the same as that of a device already permitted to operate under Section 15.247.

5. A Public Notice soliciting comments on Remington's petition was issued on May 5, 2005.[6] A list of parties that filed comments, reply comments and *ex parte* presentations is attached as an appendix to this Order. Cisco's motion to accept its late filed comments is granted.[7] Remington also submitted an analysis of the interference potential of its Eyeball R1. All of these comments and filings were considered by the Commission in reaching its decision.

III. DISCUSSION

6. It is a well established principle that the Commission will waive its rules if it determines, after careful consideration, that such a grant would serve the public interest without undermining the policy which the rule in question is intended to serve.[8] We find that a waiver of the requested provisions of 47 C.F.R. § 15.247 is consistent with that principle. The Eyeball R1 will serve the public interest because law enforcement will be able to use it to help save lives. The question is whether or not the waiver undermines the policy which the rule in question is intended to serve. In this regard, three issues were raised: potential interference to other radio operations; restrictions on the marketing and use of the equipment; and the necessity to design the equipment using analog modulation techniques instead of digital modulation. These issues are discussed in the following paragraphs. Based on this discussion, we conclude that Remington's request for waiver does not undermine the policy of Section 15.247 and that a waiver of the regulations is in the public interest. Accordingly, we are granting Remington a waiver of the requirements in Section 15.247 to employ digital modulation, including a waiver of the requirement in Section 15.247(e) to comply with the power spectral density limit applicable to digitally modulated systems.

Interference to Other Radio Operations

7. *Comments*. Cellnet, a manufacturer of automated meter reading equipment in the 902-928 MHz band, states that any waiver granted by the Commission must be conditioned on assurance from Remington that no interference will occur to unlicensed devices operating in the 915 MHz or the 2450 MHz bands, adding that the users of the Eyeball R1 must be required to resolve any interference that

[4] The minimum -6 dB bandwidth for a digital modulation system is 500 kHz. *See* 47 C.F.R. § 15.247(a)(2). Remington states that the emission bandwidth from its Eyeball R1 transmitter is 2 MHz.

[5] *See* 47 C.F.R. § 15.247(e). The spectral power density limit is 8 dBm per 3 kHz of bandwidth.

[6] *See* Public Notice, DA 05-1289. *See*, also, the Erratum to this Public Notice that was released on May 9, 2005.

[7] The Public Notice originally listed the docket number incorrectly as ET Docket No. 05-182. Cisco and SBC originally filed their comments in ET Docket No. 05-182 and refilled their comments in this proceeding.

[8] *See WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

occurs, including interference to other Part 15 unlicensed devices, and must suspend or terminate operation if interference cannot be avoided or resolved to the satisfaction of the other Part 15 device operators. Cisco and SBC express concern about interference from Eyeball R1 units to unlicensed WiFi, wireless local area networks (WLANs), and other Part 15 devices operating in the 2450 MHz band. Cisco notes that public safety officials also would use this band for WLAN operations in areas near where the Eyeball R1 is operated.[9] It states that the Eyeball R1 transmitter will result in widespread interference to existing unlicensed devices, degrading the utility of the 2450 MHz band. Cisco also claims that Remington's analog modulated device would cause substantially different interference than that produced by digitally modulated devices. Nextel, noting that public safety entities rely on services provided in unlicensed bands and in adjacent licensed spectrum, cites its concern for potential interference to the Specialized Mobile Radio (SMR)[10] service operations and, in particular, to the 896-901 MHz and 935-940 MHz SMR bands and portions of the 2496-2690 MHz band licensed to the Broadband Radio Service (BRS) and Educational Broadband Service (EBS).[11]

8. In response to Cellnet and to Nextel, Remington notes that its control transmitter, operating in the 915 MHz band, will comply with the applicable standards and is not the subject of the waiver request. Remington also responds that the area of potential interference to other unlicensed 2450 MHz band users is quite limited and supplies test data confirming this claim. Remington adds that in most situations people would not be using their LANs in the vicinity of the Eyeball R1 because these areas often will be cordoned off from the public; that the area of deployment of LANs even by the police would be far removed from the Eyeball R1 tactical environment; that officers in the vicinity of the deployed Eyeball R1 would be too busy and preoccupied with the immediate emergency situation to file reports and send e-mails over their LANs; and that people that are a few meters from the Eyeball R1 area have more important concerns than possible interference to their LANs. Remington expresses its belief that saving lives seems important enough to justify a delay in completing LAN activities.

9. Remington reiterates that the essence of its request is for a waiver of the emission type, not for the power limit on the fundamental emission or for the minimum bandwidth requirement already specified in the rules, in order to permit the use of a wideband analog signal rather than a wideband digital signal. Remington states that its product would comply with the rules if it used a digital signal. Thus, Remington argues that its product will not increase the risk of interference over that of currently permissible systems. Remington adds that the specialized nature of the Eyeball R1 application and its price will result in relatively small total sales as compared to consumer electronics products and that this equipment will sit on the shelf or in SWAT team vans most of the time.

10. *Decision*. Operation of these devices under the Section 15.247 limits generally would pose no greater interference potential than other unlicensed digital devices operating under these limits. Further, unlike many existing Part 15 devices, such as wireless high speed modem connections, that operate 24 hours a day, 7 days a week, the Remington Eyeball R1 has a battery life of about 2 hours and would be used by law enforcement personnel only for emergency situations and for training purposes. In addition, the Eyeball would be used in areas that generally are cordoned off from the public. Thus, the Remington Eyeball R1 should have less interference potential than many other products already operating under our rules. Accordingly, we do not find it necessary or appropriate, as suggested by Cellnet, to require as a condition of this waiver that the Remington Eyeball R1 must protect other Part 15 devices against harmful interference. Moreover, we note that all Part 15 devices, including WiFi systems, LANs, and meter reading systems, operate on a sufferance basis where the operator is required to accept any

[9] The 2450 MHz band is used by many different parties, including public safety officials, on an unlicensed basis under our Part 15 regulations to transmit data and other information.

[10] *See* 47 C.F.R. Part 90.

[11] *See* 47 C.F.R. Part 27.

interference that is received, regardless of the source of that interference, and must resolve any harmful interference caused to an authorized radio service.[12] It does not matter who operates the unlicensed equipment or the purpose for which the equipment is used – no protection against received interference is provided or available. With regard to Cellnet's specific concerns about interference to unlicensed devices operating in the 915 MHz band, we note that Remington has not requested nor is the Commission granting a waiver for the 915 MHz transmitter operating under Part 15 for purposes of controlling the Eyeball. As for Nextel's concerns about interference to radio services operating outside the 915 MHz and 2450 MHz bands used by the Remington device, here too Remington has not requested nor is the Commission granting a waiver of the standards applicable to unwanted, *i.e.*, spurious, emissions that may be produced by its transmitter. Any emissions appearing outside of the 2450 MHz band must be attenuated in accordance with the standards already in place in the regulations. Nextel has provided no information to demonstrate that the existing standards are not sufficient to prevent harmful interference to its cited radio operations.

Operational Limits

11. *Comments*. Alcatel, with agreement from FWCC, states that it does not oppose Remington's Request for Waiver if the marketing of the Eyeball R1 product is limited to entities eligible for licensing under Section 90.20,[13] to the U.S. Government and its agencies, and to state-licensed security and investigative services. SBC similarly states that the Commission should limit equipment sales to Federal, state and local police and public safety organizations for use only in life threatening situations. Cisco argues that Remington offers no evidence supporting its claims that its device will be restricted or limited to public safety uses in times of extreme emergency or that its marketing will be limited to public safety. Remington replies that the Eyeball R1 is too expensive, approximately $4800, for ordinary consumer applications and that far less expensive devices are available for consumers that could be used to transmit video and sound. Remington adds that its discussions with FWCC have convinced it to accept the requested restrictions as these are already reflected in Remington's marketing plans. Thus, Remington proposes that its waiver grant restrict operation to eligible users in the Public Safety Pool under Section 90.20, to Federal Government agencies that would be eligible if they were state government agencies, and to state-licensed security and investigative service providers.

12. *Decision*. We concur with the comments that any waiver of the regulations to permit the operation of the Remington Eyeball R1 should ensure that operation of the equipment is restricted to appropriate public safety agencies, permitting operation for training and for emergency situations. Accordingly, as discussed below we are requiring as a condition of the waiver that the Remington Eyeball R1 transmitter be sold only to law enforcement organizations that are eligible for licensing under the provisions of Section 90.20 of our regulations. Further, to ensure compliance we are requiring that Remington market the Eyeball R1 directly to these parties.

13. While the potential for harmful interference to the authorized radio services from Eyeball R1 units should be less than that caused by conventional LANs, WiFi systems, and other Part 15 devices, primarily due to the shorter, infrequent operating periods, and while other Part 15 devices have no protection from received interference, we believe that any potential impact from this waiver of our regulations should be minimized. However, Remington also requests a waiver of the PSD that applies to wideband digital transmission systems. We do not consider the potential for interference from the potentially higher PSD associated with analog modulation systems to be significant provided the operation of the Eyeball R1 is of short duration and for limited applications. Accordingly, we believe that

[12] *See* 47 C.F.R. § 15.5. Part 15 is not a radio service. Consequently, the requirement to resolve harmful interference caused to other users does not apply to harmful interference caused to other users of Part 15 transmission systems.

[13] *See* 47 C.F.R. § 90.20.

the sale of the Eyeball R1 under the provisions of this waiver should be restricted to law enforcement agencies. We are not permitting sales of the Eyeball R1 to public safety officials, in general, or to state-licensed security and investigative service providers. Public safety agencies also include ambulance, fire departments, and organizations other than those responsible for law enforcement. We also believe that the category for state-licensed security and investigative service providers could include a wide range of eligible parties, including department store security guards and residential neighborhood patrols. No need has been shown for any party other than law enforcement agencies to use to Eyeball R1 for counter-terrorism and hostile situations involving life-safety.

14. The potential for interference from the Eyeball R1 also is reduced by its short duration and intermittent operation due to its designed application and its normal reliance on battery power. Thus, we do not believe that a waiver should permit the Eyeball R1 imaging system to be used in fixed or otherwise permanent locations. Operation in such locations could lead to operation with an external power supply, permitting the Eyeball R1 to be operated for extended periods. This would increase the potential for interference and could encourage its application in areas that may not be under immediate police activity.[14]

15. We are not including Federal Government agencies under our list of permissible users of the Eyeball R1. Federal agencies are regulated by the National Telecommunications and Information Administration ("NTIA") under the U.S. Department of Commerce. NTIA's regulations permit Federal Government agencies to purchase and operate off-the-shelf Part 15 transmitters without further authorization as long as the transmitters are certified by this Commission. However, the Eyeball R1 transmitter is being certified and operated under the provisions of a Commission-issued waiver. While it is possible that NTIA will extend similar operating privileges of the Eyeball R1 to Federal agencies, this matter should be directed to NTIA and not to the Commission.

Analog vs. Digital

16. *Comments*. Cisco further argues that Remington has not explained why it created an analog device and why it operates in the 2450 MHz band instead of the public safety bands. Similarly, Nextel also argues that Remington does not explain why it cannot comply with the existing rules. Remington states that the Eyeball R1 was developed by an Israeli technical team for the Israeli Ministry of Defense and was adapted for U.S. deployment with a minimum of re-engineering and cost. Remington further explains that the component technology for the 2450 MHz band is immediately available whereas other bands, such as the 4.9 GHz public safety band, provides less effective propagation, even if technology for that band were immediately available. Remington also filed an *ex parte* submission explaining that the implementation of digital modulation in the Eyeball R1 would increase power consumption resulting in the need to increase battery size along with a significant enlargement to the size and weight of the device. Remington also claims that the use of digital modulation under weak signal conditions could result in sudden picture failure or staccato-like delayed images that could mislead the user into believing that a picture several seconds old represents the current situation. Remington adds that analog signals fail gracefully, providing visual indication that the signal strength is declining below usable levels. Finally, Remington estimates that the incorporation of a digital design would increase the cost of the Eyeball R1 by as much as 50 percent which could deny availability to as many as 40 percent of the law enforcement organizations, particularly those in more rural areas with tighter budgets.

[14] We recognize that the Eyeball R1 transmitter occasionally may be operated while mounted on a pole, tripod, cable or other means of support. We also recognize that there may be occasions where the use with these methods of support could include the connection of the Eyeball R1 to an external power source to permit operation beyond the time frame that would be available from reliance on the battery supply alone. As long as the Eyeball R1 is used only by the appropriate law enforcement agencies for emergencies involving safety of life and for training purposes, such applications would be temporary and would not be classified as fixed operations.

17. *Decision*. Remington provides convincing arguments as to its reasons for employing analog modulation instead of digital. We conclude that requiring Remington to redesign its Eyeball R1 transmitter to use digital modulation would increase the cost of the devices to police departments, preventing some departments from being able to obtain this equipment, and would restrict or further delay the introduction of the Eyeball R1 to the law enforcement community. We concur with Remington that its Eyeball R1 has the potential for saving the lives not only of public safety officials but also members of the public in hostage and similar situations.

Summary of Waiver Conditions

18. Based on the above, we are granting the waiver requested by Remington to allow operation of the Eyeball R1 units under the Section 15.247 emission limits subject to the following conditions.

- The Eyeball transmitters shall be certified by the Commission, demonstrating compliance with the technical standards applicable to operation under 47 C.F.R. § 15.247. However, compliance need not be demonstrated with the requirement in 47 C.F.R. § 15.247 to employ digital modulation or with the power spectral density limit in 47 C.F.R. § 15.247(e).

- The Eyeball transmitters shall be marketed by Remington only directly to law enforcement organizations that are eligible for licensing under the provisions of Section 90.20 of our regulations.[15] Any offer for sale or lease of the device must include the following statement: "This device has been authorized by the Federal Communications Commission for sale only directly to law enforcement organizations that are eligible for licensing under the provisions of Section 90.20 of the Commission's rules. This device has not been authorized and may not be offered for sale or lease, or sold or leased, to any other entities."

- The Eyeball transmitters shall be used only by law enforcement agencies for emergencies involving safety-of-life and for training purposes. The transmitters shall not be used for permanent or fixed operations. These operating restrictions shall be clearly and conspicuously noted by Remington in all instructions and training materials included or otherwise made available with its Eyeball transmitters. Such instructions and training materials shall also contain a clear and conspicuous warning that failure to comply with these operating restrictions could result in harmful interference to other spectrum users.

- This waiver shall apply only to the Remington Eyeball R1; however, the waiver shall also apply to any subsequent models that have the same emission characteristics, *i.e.*, analog modulation, transmitter power, bandwidth, etc.

[15] The equipment may, however, be marketed under the statutory exceptions listed in 47 C.F.R. § 2.807, *e.g.*, radio frequency devices for use by the Government of the United States or any agency thereof.

IV. ORDERING CLAUSES

19. Based on the above, we conclude that granting Remington's Request for Waiver would serve the public interest, convenience and necessity. Accordingly, IT IS ORDERED that the Request for Waiver filed by Remington Arms Company IS GRANTED, as described above. This action is taken pursuant to Sections 4(i), 302, 303(e), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 302, 303(e), and 303(r).

20. For further information regarding this Order, contact John A. Reed, Office of Engineering and Technology, (202) 418-2455, john.reed@fcc.gov.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX

Comments, reply comments and *ex parte* comments were filed by:

1. Alcatel
2. Cellnet Technology, Inc.
3. Cisco Systems, Inc.
4. Deputy Sheriff Mike Thieman
5. Fixed Wireless Communications Coalition (FWCC)
6. Nextel Communications, Inc.
7. Remington Arms Company
8. SBC Communications Inc.
9. Sheriff Sam Page